

CFR 50.73 (a)(2)(v)(B)

February 19, 2010

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555-0001

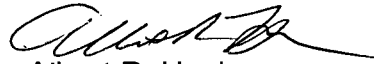
Subject: **Docket No. 50-361**  
**Licensee Event Report No. 2009-004**  
**San Onofre Nuclear Generating Station, Unit 2**

Dear Sir or Madam:

This submittal provides Licensee Event Report (LER) 2009-004 to report a loss of safety function when both trains of the Unit 2 Spent Fuel Pool Cooling System were inoperable pursuant to 10 CFR 50.73(a)(2)(v)(B). This event is of low safety significance and did not affect the health and safety of either plant personnel or the public.

If you require any additional information, please contact me.

Sincerely,

  
Albert R. Hochevar  
Station Manager

Unit 2 LER No. 2009-004

cc: E. E. Collins, NRC Regional Administrator, Region IV  
G. G. Warnick, NRC Senior Resident Inspector, San Onofre Units 2 & 3

1E22  
NRR

<b>NRC FORM 366</b> (9-2007)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		APPROVED BY OMB: NO. 3150-0104		EXPIRES: 08/31/2010						
<b>LICENSEE EVENT REPORT (LER)</b> <small>(See reverse for required number of digits/characters for each block)</small>												
<b>1. FACILITY NAME</b> San Onofre Nuclear Generating Station Unit 2				<b>2. DOCKET NUMBER</b> 05000-361		<b>3. PAGE</b> 1 OF 3						
<b>4. TITLE</b> Both Trains of Spent Fuel Pool Cooling Inoperable Results in a Loss of Safety Function												
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED			
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER		
12	23	2009	2009-004-00			02	19	2010				
9. OPERATING MODE			De-fueled			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.73 (Check all that apply)						
10. POWER LEVEL			0						20.2201(b)			
									20.2203(a)(3)(ii)			
									50.73(a)(2)(ii)(B)			
									50.73(a)(2)(ix)(A)			
									20.2201(d)			
									20.2203(a)(4)			
									50.73(a)(2)(iii)			
									50.73(a)(2)(x)			
									20.2203(a)(1)			
									50.36(c)(1)(i)(A)			
									50.73(a)(2)(iv)(A)			
									73.71(a)(4)			
									20.2203(a)(2)(i)			
									50.36(c)(1)(ii)(A)			
									50.73(a)(2)(v)(A)			
									73.71(a)(5)			
									20.2203(a)(2)(ii)			
									50.36(c)(2)			
									X 50.73(a)(2)(v)(B)			
									OTHER			
									20.2203(a)(2)(iii)			
									50.46(a)(3)(ii)			
									50.73(a)(2)(v)(C)			
									20.2203(a)(2)(iv)			
									50.73(a)(2)(i)(A)			
									50.73(a)(2)(v)(D)			
									20.2203(a)(2)(v)			
									50.73(a)(2)(i)(B)			
									50.73(a)(2)(vii)			
									20.2203(a)(2)(vi)			
									50.73(a)(2)(i)(C)			
									50.73(a)(2)(viii)(A)			
									20.2203(a)(3)(i)			
									50.73(a)(2)(ii)(A)			
									50.73(a)(2)(viii)(B)			
12. LICENSEE CONTACT FOR THIS LER												
NAME								TELEPHONE NUMBER (Include Area Code)				
Douglas R. Bauder, Plant Manager								949-368-4685				
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT												
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX			
C	BS	STR	B580	Y								
14. SUPPLEMENTAL REPORT EXPECTED								15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)								X NO				
<b>16. ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)												
<p>On 12/23/2009 at about 0957 PST with Unit 2 defueled for a refueling outage, Train A Salt Water Cooling (SWC) low flow and Component Cooling Water (CCW) Heat Exchanger high differential pressure alarms were received in the control room. The reduction in SWC flow was suspected to be caused by debris in the CCW heat exchanger. To clear the debris, Operators stopped the Train A SWC pump at approximately 1014 PST, realigned the system for reverse flow, and restarted the SWC pump at 1116 PST. While the Train A SWC pump was stopped, the temperature in the Spent Fuel Pool (SFP) increased from about 74 to 78 degrees F.</p> <p>Train B CCW System was previously removed from service for scheduled maintenance. With both trains of the CCW system out of service, SFP cooling was suspended for approximately 62 minutes while the Train A SWC pump was off. Based on guidance from the NRC, this event is being reported under 10 CFR 50.73(a)(2)(v)(B) as a loss of safety function of systems that are needed to remove residual heat.</p> <p>Investigation subsequently found the flow decrease was the result of a damaged SWC pump suction strainer that allowed ocean debris to enter the CCW heat exchangers.</p> <p>The safety significance of this event was low since the temperature of the SFP remained below the maximum allowed 160 degrees F and all other applicable licensing controlled specifications were met.</p>												

## LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

1. FACILITY NAME	2. DOCKET NUMBER	6. LER NUMBER			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REV NO	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	2009	--004--	00	2 of 3

Plant: San Onofre Nuclear Generating Station (SONGS) Unit 2  
Event Date: December 23, 2009  
Reactor Vendor: Combustion Engineering  
Mode: Defueled  
Power: 0 percent

**Background:**

The Spent Fuel Pool (SFP) Cooling System is cooled by the Component Cooling Water (CCW) System [CC] through the SFP Heat Exchangers. The Saltwater Cooling (SWC) System [BS] supplies ocean water to cool the CCW System through two redundant CCW Heat Exchangers (Train A and Train B) [HX]. For maximum cooling capacity, the CCW Heat Exchangers are normally configured such that the SWC flow in the tubes and the CCW flow in the shell are in opposite directions. To clear debris which could potentially block the salt water flow through the CCW Heat Exchanger, the system can be realigned so the salt water flow is reversed to flow in the same direction as the CCW flow through the CCW Heat Exchanger. Approved procedures are in place to realign the system for reverse flow conditions.

Technical Specification (TS) 3.7.16 requires the SFP water level to be maintained greater than 23 feet over the top of the fuel assemblies during movement of fuel assemblies in the SFP.

There are no specific applicable TSs for the CCW Heat Exchangers when the plant is in the defueled condition. Licensee Controlled Specification (LCS) 3.7.106 "Spent Fuel Pool Operation," is applicable at all times with irradiated fuel in the SFP. With the plant defueled and the core fully offloaded, the LCS requires the water in the SFP to be maintained less than 160 degrees F. For two SFP cooling pumps and/or two SFP heat exchangers not operable the following actions are required by the LCS:

- B.1 Suspend all operations involving increase in SFP decay heat load within 1 hour,
- B.2 Monitor the temperature of the SFP water and estimate the time before water temperature will increase to the 160 degree F limit within 1 hour and once per shift thereafter, and
- B.3.1 Initiate action to restore the component(s) to OPERABLE or operating status more than 12 hours prior to the estimated time at which water temperature will increase to the limit.

**Event Description:**

On December 23, 2009, at about 0957 PST, with Unit 2 in the steam generator replacement outage and defueled, Train A Salt Water Cooling (SWC) low flow alarm and CCW Heat Exchanger high differential pressure alarm were received in the control room. Since Train B Component Cooling Water System had been removed from service for scheduled maintenance, Operators initiated actions in accordance with the Abnormal Operating Instructions (AOI) for loss of CCW and SWC.

The reduction in SWC flow was suspected to be caused by debris in the CCW heat exchanger. In accordance with the AOI procedure, actions to clear the debris and restore SWC flow were completed. At approximately 1014 PST, Operators stopped the SWC pump, declared Train A SFP Cooling System INOPERABLE, and completed actions required by LCS 3.7.106B when two SFP heat exchangers are inoperable (listed above). With the SWC pump off, Operators changed the valve line up to reverse SWC flow through the CCW heat exchanger, and at 1116 PST restarted the SWC pump.

Prior to stopping the SWC pump to establish reverse flow conditions, the temperature of the SFP was not affected by the reduction in SWC flow. The cooling capacity of the SWC system significantly exceeds the

**LICENSEE EVENT REPORT (LER)**

TEXT CONTINUATION

1. FACILITY NAME	2. DOCKET NUMBER	6. LER NUMBER			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REV NO	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	2009	--004--	00	3 of 3

SFP cooling load when the plant is defueled. While the SWC pump was off, the SFP temperature increased from about 74 to 78 degrees F. Calculations performed at about 1055 PST estimated the time to exceed the maximum allowed temperature of 160 degrees F was approximately 23 hours.

At 2111 PST, Operators declared Train A SFP cooling OPERABLE after verifying proper SWC flow had been restored and the temperature of the SFP was stable.

Train A CCW Heat Exchanger was operated in reverse flow mode until taken out of service for maintenance on January 1, 2010 after Train B was declared OPERABLE. Upon investigation, SCE determined the cause of the SWC low flow alarm was ocean debris (such as kelp) obstructing flow through the CCW heat exchanger. The debris appeared to have entered the system through a damaged SWC pump suction strainer [STR].

**Corrective Actions**

The SWC pump with the damaged suction strainer was replaced.

**Basis for Reporting:**

This event was not reported in an eight-hour report under 10 CFR 50.72(b)(3)(v) because it was not considered a loss of safety function at the time of the event.

Based on subsequent guidance from the NRC, the temporary stopping of Train A SWC flow while Train B was out of service for maintenance constituted a loss of safety function as evidenced by the increase in SFP temperature. This event, therefore, is being reported in accordance with 10.CFR 50.73(a)(2)(v)(B) as an event that could have prevented the fulfillment of a safety function of systems that are needed to remove residual heat.

**Safety Significance:**

The safety significance of this event was minimal. The maximum SFP temperature during this event was 78 degrees F, which is well below the maximum allowed temperature of 160 degrees F per the Licensee Controlled Specification. With the SWC pumps off, the time to exceed the maximum allowed temperature was approximately 23 hours. Alternate methods of cooling the SFP were available if required. The approximate 4 degree F increase in SFP temperature was an expected result of the reverse flow evolution, which was performed in accordance with an approved operating procedure. All LCS requirements for two trains of SFP cooling inoperable were met and the water level in the SFP was maintained at least 23 feet above the spent fuel as required by the TS.

**Previous Occurrences**

On February 13, 2007, both Unit 2 SFP cooling pumps were inoperable when a thermal overload circuit tripped the Train B SFP cooling pump while the Train A SFP cooling pump was out of service for scheduled maintenance. The SFP temperature increased by about 2 degrees F while SFP cooling was restored (approximately 70 minutes). SCE did not previously report this event as a loss of safety function. Based on guidance from the NRC, a Licensee Event Report will be submitted to report this event as a loss of safety function.